What is claimed is:

1. A laser diode comprising:

a substrate;

a lower material layer formed on the substrate;

a resonance layer formed on the lower material layer;

an upper material layer formed on the resonance layer and having a ridge at the top;

a buried layer having a contact hole corresponding to the ridge of the upper material layer;

a protective layer formed of a material different from the material of the buried layer, and having an opening corresponding to the contact hole of the buried layer; and

an upper electrode formed on the protective layer to contact an upper surface of the ridge through the contact hole.

2. The laser diode of claim 1, wherein the lower material layer includes:

a first compound semiconductor layer stacked on the substrate; and

a lower cladding layer stacked on the first compound semiconductor layer.

3. The laser diode of claim 2, wherein the first compound semiconductor layer is an n-GaN based group III-V nitride semiconductor layer.

4. The laser diode of claim 2, wherein the lower cladding layer is an n-GaN/AlGaN layer.

5. The laser diode of claim 1, wherein the resonance layer further includes:

a lower waveguide layer stacked on the lower cladding layer and having a refractive index larger than that of the lower cladding layer;

an active layer stacked on the upper surface of the lower waveguide layer to generate a laser beam; and

an upper waveguide layer stacked on the active layer.

6. The laser diode of claim 5, wherein the refractive indexes of the upper and lower waveguide layers are lower than the refractive index of the active layer.

7. The laser diode of claim 5, wherein the active layer is a GaN based group III-V nitride compound semiconductor layer of $In_xAl_yGa_{1-x-y}N$ where $0 \leq x \leq 1$, $0 \leq y \leq 1$, and $x+y \leq 1$.

8. The laser diode of claim 1, wherein the upper material layer includes:

an upper cladding layer stacked on the upper waveguide layer and having the ridge and a refractive index smaller than that of the upper waveguide layer; and

a second compound semiconductor layer formed on the ridge.

9. The laser diode of claim 8, wherein the upper cladding layer is a p-GaN/AlGaN layer.

10. The laser diode of claim 8, wherein the second compound semiconductor layer is a p-GaN based group III-V nitride semiconductor layer.

11. A manufacturing method of a laser diode, the method comprising:

forming a laser oscillating structure including a substrate, a resonance layer on the substrate, and cladding layers formed on and under the resonance layer and having a ridge protruding to a predetermined height;

forming a buried layer on top of the structure to cover the surface of the ridge;

sequentially forming a protective layer and an etch back material layer on the surface of the buried layer;

etching the etch back material layer by an etch back process to a predetermined depth to expose a portion of the protective layer at the upper direction of the ridge;

removing the portion of the protective layer, which is not covered by the etch back material layer, by using an etchant to form an opening which exposes a portion of the surface of the buried layer on the ridge;

removing the etch back material layer remained on the buried layer;

forming a contact hole by etching the portion of the buried layer, which is exposed through the opening of the protective layer; and

forming an upper electrode that contacts to the top surface of the ridge through the contact hole on the protective layer.

12. The method of claim 11, wherein the forming of the layer oscillating structure further includes:

forming a lower material layer including a lower cladding layer, on the substrate;

forming a resonance layer including an active layer, on the lower material layer; and

forming an upper material layer, which includes an upper cladding layer and a contact layer and having the ridge protruding to a predetermined height, on the resonance layer.

13. The method of claim 11, wherein the forming of the lower material layer further includes:

forming a first compound semiconductor layer on the substrate; and

forming the lower cladding layer on the first compound semiconductor layer.

14. The method of claim 13, wherein the first compound semiconductor layer is formed of n-GaN based group III-V nitride.

15. The method of claim 13, wherein the lower cladding layer is formed of n-GaN/AlGaN.

16. The method of claim 11, wherein the forming of the resonance layer further includes:

forming a lower waveguide layer having a refractive index larger than that of the lower cladding layer, on the lower cladding layer;

forming an active layer that generates a laser beam, on the lower waveguide layer; and

forming an upper waveguide layer on the active layer.

17. The method of claim 16, wherein the upper and lower waveguide layers are formed of materials having refractive indexes smaller than that of the active layer.

18. The method of claim 17, wherein the upper and lower waveguide layers are formed of GaN based group III-V compound.

19. The method of claim 16, wherein the active layer is formed of GaN based group III-V nitride compound of $In_xAl_yGa_{1-x-y}N$ where $0 \leq x \leq 1$, $0 \leq y \leq 1$, and $x+y \leq 1$.

20. The method of claim 12, wherein the forming of the upper material layer further includes:

forming an upper cladding layer having a refractive index smaller than that of the upper waveguide layer, on the upper waveguide layer; and

forming a second compound semiconductor layer on the upper cladding layer.

21. The method of claim 20, wherein the upper cladding layer is formed of p-GaN/AlGaN.

22. The method of claim 20, wherein the second compound semiconductor layer is formed of p-GaN based group III-V nitride.

23. The method of claim 11, further including forming a lift-off layer having an opening at a portion corresponding to the ridge, on the second material layer, after the etch back material layer is removed and before the contact hole is formed.